L 04564-67 EWT(1) SCTB DD

ACC NR: AP6033153 SOURCE CODE: UR/0238/66/012/005/0655/0660

16
B

AUTHOR: Slyn'ko, P. P.

ORG: Division of Hypoxia and Hyperoxia, Institute of Physiology im. O. O. Bohomolets, Academy of Sciences UkrSSR (Viddil fiziolohiyi hipo- i hiperoksychnykh staniv Instytutu fiziolohiyi Akademiyi nauk UkrSSR)

TITLE: Electrical conductivity of the skin during brief hypoxia

SOURCE: Fiziolohichnyy zhurnal, v. 12, no. 5, 1966, 655-660

TOPIC TAGS: electromyography, hypoxia, animal experiment, skin physiology

ABSTRACT: This study was undertaken in an attempt to standarize equipment and methods for recording the conductivity of living tissues using various sensors. A portable, low-frequency, low-voltage apparatus operating on alternating current was devised for electrometric or graphic recording of the galvanic skin reaction, electrical conductivity of the skin, permeability, amount of perspiration, skin temperature, and other indices, using special electrodes and sensors. Experiments conducted with this apparatus on rabbits showed that brief general or localized hypoxia does not produce noticeable changes in the electrical conductivity of skin which has no sweat glands or malfunctioning ones. Changes in skin temperature and electrode temperature caused changes in skin conductivity of about 2.6% per 1C, when a thin-

Card 1/2

SLYNSAREV, G. G.

4-58-6-37/37

AUTHOR: None Given

TITLE: Optical Fables (Opticheskiye nebylitsy)

PERIODICAL: Znaniye - sila, 1958, Nr 6, p 56 and inner page of the rear cover (USSR)

ABSTRACT: In his book "On Possibilities and Impossibilities in Optics", Professor G.G. Slynsarev destroys the following "optical fables": 1) it is not true that the range of radio-locators depends on the size of the antenna; 2) it is not possible to construct a "concentrating cone" to illuminate or to heat an item with diffused light; 3) all suggestions to concentrate parallel ray pencils are wrong, because parallel ray pencils are simply a fiction; 4) all efforts to combine a telescope with a microscope to disclose cosmic secrets are useless; 5) one often reads of fires caused by bottles or decanters which concentrated sunbeams (that is pure nonsense, for the possibility is equal to zero).
There are 5 drawings.

1. Optics--USSR

Card 1/1

SLYS, Jozef

The characteristic and mining results of WOS-1200 and BU-75 drilling rigs. Wiad naft 9 no.9:197-200 S '63.

ACC NR: AP7002080

interstellar gas is in the ionized state. The zone of ionization about the sun, the radius of which is 1/100 light year, is the interplanetary medium that appears in measurements below 200 kHz. Orig. art. has: 1 diagram and 1 graph.

SUB CODE: 03/ SUBM DATE: none

Card 2/2

ACC NR: AP7000550 SOURCE CODE: UR/0293/66/004/006/0923/0931

AUTHOR: Slysh, V. I.

ORG: none

TITLE: Measurements of cosmic radio emission in the kilometer-wave range in interplanetary space

SOURCE: Kosmicheskiye issledovaniya, v. 4, no. 6, 1966, 923-931

TOPIC TAGS: radio astronomy, cosmic radio source, radio emission

ABSTRACT: Data concerning the intensity of low-frequency emission in interplanetary space in the 20—2200 kc range were obtained from measurements made by the Zond-2, Zond-3, and Venera-2 interplanetary stations. Data obtained by the Zond-2 show that the radio emission on the 210-kc frequency is approximately 3 x 10^{-18} w/m² kc, a value approximately 100 times greater than the expected radio emission stream from the galaxy on this frequency. The Zond-3, launched on 18 July 1965 in the direction of the orbit of Mars, was equipped with a three-channel measuring receiver with channel frequencies of 20, 210, and 2000 kc. A dipole formed by the housing of the station and a 3.75-m metallic rod antenna was used in both the Zond-2 and Zond-3 stations. The Venera-2 was also equipped with a three-channel measuring receiver.

Card 1/2 UDC: 523.164:629.195

ACC NR: AP7000550

which operated on frequencies of 30, 200, and 985 kc. Its antenna was similar to those used on Zond-type stations. These experiments established that radio emission intensities on frequencies of 985, 2000, and 2200 kc are in good agreement with galactic noise data obtained by other authors. In the 210—20 kc range the spectrum increases sharply toward lower end frequencies. The change in intensity with distance, the observation of interference lobes, and, possibly, screening by the Moon indicate Jupiter as an emission source at a frequency of 200 kc. Screening by the Moon occurs during differential refraction in the upper ionosphere. Radio emission in the 20—30 kc frequency range can be explained by the fluctuation noise of interplanetary electrons. Agreement between Jupiter's radio emission spectra on kilometer and decameter waves was also noted. Obtained data indicate that Jupiter is a source of very powerful low-frequency radio emissions. If the spectrum ranges up to 100 kc, the total power of the low-frequency emission is approximately 10^{20} erg/sec. This value is 1000 times greater than Jupiter's decimeter wave emission and constitutes 10^{-5} of the planet's total thermal emission. Orig. art. has: 8 figures and 8 formulas. [WA-3]

SUB CODE: 03/ SUBM DATE: 24Jun66/ ORIG REF: 002/ OTH REF: 004

ATD PRESS/5111

Card 2/2

L 5033-66 FSS-2/EWT(1)/FS(v)-3/FCC/EWA(d)/EWA(h) TT/GW

ACC NR: AP5026056 SOURCE CODE: UR/0293/65/003/005/0760/0767

60
23

AUTHOR: Slysh, V. I.

ORG: none

TITLE: Measurement of 210-kc and 2200-kc cosmic radiation at a distance of 8 Earth radii by the Zond-2 interplanetary station

SOURCE: Kosmicheskiye issledovaniya, v. 3, no. 5, 1965, 760-767

TOPIC TAGS: cosmic radiation, interplanetary probe, spacecraft, radiometer

ABSTRACT: Radiometer measurements of cosmic radiation of 210 kc and 2200 kc recorded on the Zond-2 space probe are described. The portion of flight covered is the first two hours after launch, during which the probe travelled some 8 Earth radii (50,000 km). Both radiometers were crystal-controlled superheterodyne types using a common 3.75-m dipole antenna. An automatic control feature was incorporated to trim antenna capacitance and maintain calibration as the vehicle passed through regions of varying dielectric constant. The accompanying figure shows a plot of signal strength vs distance. The initial high level of 2200 kc registered in the first 10,000 km is deduced to have originated from Earth sources, since simultaneous ground data (Moscow, night time) showed that the ionospheric cutoff frequency during this interval was on the order of 1—2 Mc. The subsequent sharp drop in signal corresponds to Zond-2's emergence into the Earth's day side. The reason for the similar behavior of the

Card 1/3 UDC: 523.164:629.198.3

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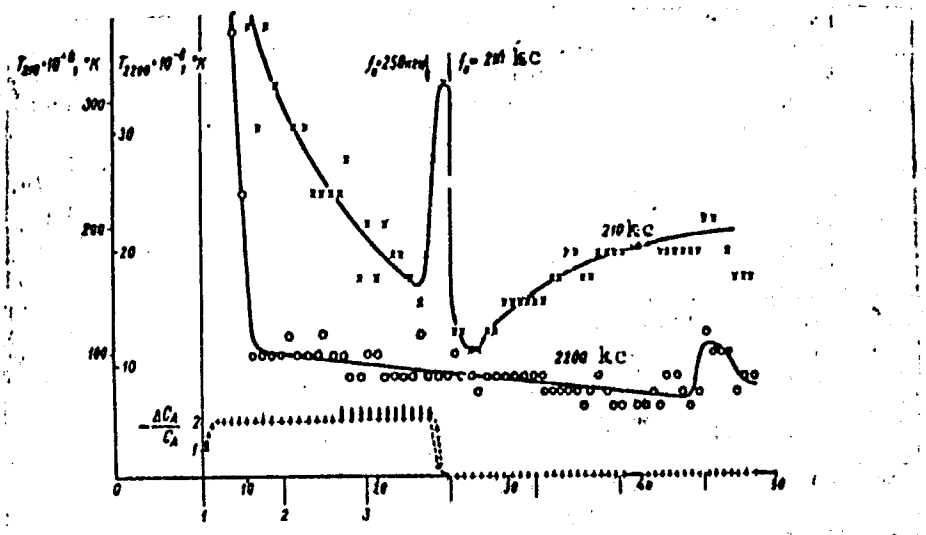
L 5033-66

ACC NR: AP5026056



Cosmic radiation recorded by Zond-2

x - 210 kc; o - 2200 kc; + - antenna capacitance correction.

Card 2/3

L 5033-66

ACC NR: AP5026056

210-kc signal is not explained. The sharp 210-kc peak near the 25,000-km point is ascribed to the craft's passing through a region where ambient plasma frequency was also 210 kc. Other features of the curves are discussed and related to vehicle rotation and position relative to the Earth, the Sun, and the Van Allen belts. From their data, the authors arrive at an estimated electron density profile for the range measured. Orig. art. has: 3 figures and 1 formula. [SH]

SUB CODE: AA, SV/ SUBM DATE: 23Mar65/ ORIG REF: 001/ OTH REF: 003/ ATD PRESS: 4132

Card 3/3

L 18748-66 EWT(1) GW

ACC NR: AP5028690 SOURCE CODE: UR/0053/65/087/003/0471/0489

AUTHOR: Slysh, V. I.

ORG: none

TITLE: Interferometers in astrophysics

SOURCE: Uspekhi fizicheskikh nauk, v. 87, no. 3, 1965, 471-489

TOPIC TAGS: interferometer, astrophysics, astrophysics instrument, stellar, astronomy stellar magnitude

ABSTRACT: This is a review article dealing with the use of interferometers operating in the optical and in the radio bands for the measurements of angular diameters of stars. The interferometers described are the Michelson stellar interferometer, the Michelson radio interferometer, and the intensity interferometer proposed by Hanbury Brown (Phil. Mag. v. 45, 603, 1954) and its several modifications. The limitations imposed on the use of different types of interferometers by resolution and by internal noise are discussed in de-

Card 1/2

L 18748-66

ACC NR: AP5028690

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tail, and formulas are presented for the spatial correlation of radiation as applied to the intensity interferometer. Preliminary results of measurement of stellar diameters with intensity interferometers are reported and possible means of improving and modifying the various types of interferometers are described. Orig. art. has: 10 figures and 18 formulas.

SUB CODE: 03 NR REF SOV: 005/ OTH REF: 025

Card 2/2 SM

SLYSHA, V.I.[translator]; BAGARYATSKIY, B.A., red.; RUSKOL, Ye.L., red.; PANTAYEVA, V.A., red.; DZHATUTEVAM F,Kh., tekhn. red.

[Experimental investigation of space near the earth] Eksperimental'noe issledovanie okolozemnogo kosmicheskogo prostranstva. Moskva, Izd-vo inostr. lit-ry, 1961. 277 p. (MIRA 15:4)
Translated from the English.
(Solar system)

SLYSH, V.I. (Moskva)

Polarization of the A galaxy. Priroda 51 no.11:106-107 N '62. (MIRA 15:11)

(Galaxies)
(Radio astronomy)

SLYSH, V.I., (Moskva)

Ionosphere of Venus; radar research. Priroda 52 no.9:68-71 '63. (MIRA 16:11)

ACCESSION NR: AR4014621 S/0269/64/000/001/0055/0055

SOURCE: RZh. Astronomiya, Abs. 1.51.380

AUTHOR: Slyush, V. I.

TITLE: Angular dimensions of radio stars

CITED SOURCE: Astron. tsirkulyar, maya 6, no. 243, 1963, 1-2

TOPIC TAGS: star, radio star, nonthermal radio emission, synchrotron radiation, meter wave, decimeter wave

TRANSLATION: The theory of self-absorption of synchrotron radiation has been used to determine the relation between the frequency of the maximum of the spectrum of sources of nonthermal radio emission and their apparent angular dimensions. It is shown that for radio sources with angular dimensions $< 1''$ the frequency of the maximum of the spectrum should fall in the range of meter and decimeter waves. The spectra for the sources 3C-48 and STA-21 were used to determine their angular dimensions -- $0''.14$ and $0''0.05$ respectively. W. S.

Card 1/2

SLYSH, V.I.

Nature of the radio-frequency radiation of flare-up stars.
Astron. zhur. 41 no.6:1038-1041 N-D '64 (MIRA 18:1)

1. Gosudarstvennyy astronomicheskiy institut im. P.K.Shternberga.

L 5180-66 EWT(d)/FSS-2 GS

ACC NR: AT5024310 SOURCE CODE: UR/0000/65/000/000/0061/0067

AUTHOR: Slysh, V. I.

38
B+1

ORG:

State Astronomy Institute im. P. K. Shternberg (Gosudarstvennyy astronomicheskiy institut); MGU, Moscow

TITLE: Radio astronomy criteria of artificiality of radio sources 4

SOURCE: Vsesoyuznoye soveshchaniye, posvyashchennoye probleme vnezemnykh tsivilizatsiy. 1st, Byurakan, 1964. Vnezemnyye tsivilizatsii (Extraterrestrial civilizations); trudy soveshchaniye. Yerevan, Izd-vo AN ArmSSR, 1965, 61-67

TOPIC TAGS: galactic radiation, radio astronomy, planet, astrophysics, planetary life

ABSTRACT: A discussion is presented of the means for establishing the nature of radio signals from outer space. On the basis of a detailed analysis of the properties of natural radiation sources in outer space, N. S. Kardashev offers the

Card 1/2

090/3744

L 5180-66

ACC NR: AT5024310

following radio astronomy criteria for possible artificiality of a radio source: 1) the spectrum—a maximum in the range 3 to 10 cm, a linear decrease on higher frequencies; 2) small angular dimensions; 3) variation in time. Each of the three criteria is examined in detail. Natural sources of radiated signals in the overwhelming majority of cases are characterized as having a so-called step spectrum where the power of the radiation diminishes with increasing frequency, as $f^{-\alpha}$, where α is the spectral index. Examples of the above fact are cited, and it is pointed out that natural sources do not have a bounded frequency but do have an asymptote of the spectrum as a frequency axis. Even for the most effective radiation mechanism there exists a lower limit on the angular dimensions of a given radiation stream. Broadcasts from artificial sources are extraordinarily limited for two reasons: transmission from a civilized source must be limited to, at most, the dimensions of planetary systems, and the apparent angular dimension of artificial transmitters must be limited by the rate of information transmittal. Time variation of transmission is associated with modulation of coded information, as a civilized source would presumably attempt to do. A discussion and examples of certain stellar radiation are presented, and some basic formulae for the statistical properties of signals are given. Orig. art. has: 1 figure and 3 equations.

SUB CODE: AA/ SUBM DATE: 26May65

Card 2/2 hd

L 00825-66 FBD/EWT(1)/EWG(v)/EEC-4 GW/WS-4

ACCESSION NR: AP5020670 UR/0033/65/042/004/0689/0693 37
523.164.42 35

AUTHOR: Slysh, V. I. 55 B

TITLE: Peculiarities of polarized radiation of the Crab nebula and the radio galaxy CYG-A

SOURCE: Astronomicheskiy zhurnal, v. 42, no. 4, 1965, 689-693

TOPIC TAGS: polarized radiation, nebula, radio astronomy, 12155 radio source, galaxy, 12155 magnetic field

ABSTRACT: Peculiarities of depolarization and Faraday rotation of the radio sources Tau-A and Cyg-A were found from analysis of the results of polarization measurements. The radiation spectra of the Crab nebula are divided into polarized radiation spectra, expected radiation spectra from the central region with a 2' diameter, and the expected total radiation spectra. It is found that the polarized radiation in the centimeter region from the center of the nebula shows low frequency harmonics of electron emission with large energies. The polarization of the radio source Cyg-A is characterized by a sharp drop in the degree of polarization as a function of the wavelength and shows a rather strong polarization plane rotation. This anomalously large Faraday rotation of the

Card 1/3

L 00625-66

ACCESSION NR: AP5020670

2

polarization plane---1170 rad·m^2---is postulated to have originated in the magnetoactive medium which is connected with the optical galaxy located between the components of the source Cyg-A (see Fig. 1 on the Enclosure) Orig. art. has 4 figures.

ASSOCIATION: Gosudarstvennyy astronomicheskiy institut im. P. K. Shternberga (State Astronomical Institute)

55

SUBMITTED: 17 Nov 64 ENCL: 01 SUB CODE: AA

NO REF SOV: 004 OTHER: 009

Card 2/3

ACCESSION NR: AP5020670 ENCLOSURE: 01

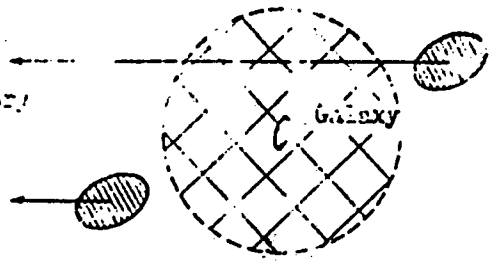

Fig. 1. Relative positions of the radio source regions and the magnetoactive medium

Card 3/3

L 00827-66 EWT(1)/EWG(v) GW

ACCESSION NR: AP5020687 UR/0033/65/042/004/0863/0864
523.14

AUTHORS: Dashevskiy, V. M.; Slysh, V. I. 55 55

TITLE: Problem of light propagation in a nonuniform universe

SOURCE: Astronomicheskiy zhurnal, v. 42, no. 4, 1965, 863-864

TOPIC TAGS: light propagation, universe, galaxy, intergalactic matter 12,55

ABSTRACT: Consider the universe, which is homogeneous on the average, but part of whose matter is concentrated into discrete galaxies; the other part is gaseous (with zero pressure) uniformly filling space with density $\rho_g = \alpha\rho$, where α is a constant and ρ is the density of all the matter in the universe. The change in the transverse component of the light quantum pulse is given by

$$\frac{dq}{cdt} = -\frac{4\pi G\rho_g h}{c^2}.$$

Introducing dz/cdt = q/h, ha(t) = const, the following differential equation is obtained

$$\ddot{z} - \frac{2}{3}t\dot{z} + \frac{2\alpha}{3}z = 0.$$

The solution of this equation gives for the angular dimension

Card 1/3

L 00827-66

ACCESSION NR: AP5020687

$$f(\Delta)=\frac{H_0}{c}R=\frac{2}{k}(1-\Delta)^{(3-k)/4}[1-(1-\Delta)^{k/2}];\quad k=\sqrt{25-24a},$$

$$0<a<1.1<k\leqslant 5,$$

which always has a maximum, even at $p \neq 0$ (see Fig. 1 on the Enclosure). Orig. art. has: 5 formulas and 1 figure.

ASSOCIATION: Otdeleniye prikladnoy matematiki, Akademiya nauk SSSR (Applied Mathematics Branch of the Academy of Sciences SSSR); Gosudarstvennyy astronomicheskiy institut im. P. K. Shternberg (State astronomical Institute)

SUBMITTED: 04Jan65 ENCL: 01 SUB CODE: AA

NO REF SOV: 002 OTHER: 000

Card 2/3

L00827-66
ACCESSION NR: AP5020687

ENCLOSURE: 01

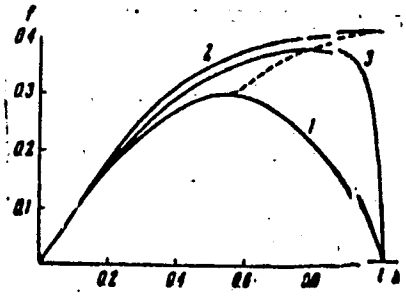

Fig. 1.

Card 3/3

ACC NR: AP6036790 (N) SOURCE CODE: UR/0363/66/002/011/1991/1997

AUTHOR: Bazhenova, L. N.; Ivan'ko, A. A.; Samsonov, G. V.; Slyshankova, V. A.

ORG: Kiev Polytechnic Institute (Kiyevskiy politekhnicheskiy institut)

TITLE: Microhardness of some oxides

SOURCE: AN SSSR. Izvestiya. Neorganicheskiye materialy, v. 2, no. 11, 1966, 1991-1997

TOPIC TAGS: oxide microhardness, aluminum oxide, beryllium oxide, magnesium oxide, calcium oxide, titanium oxide, zirconium dioxide, hafnium dioxide, niobium pentoxide, chromic oxide, HARDNESS, STRESS CONCENTRATION

ABSTRACT: The microhardness of a series of oxides has been tested with various indenter loads (30—200 g) applied for various lengths of time. It was found that the microhardness of oxides decreases with increased load and increased test duration. The average microhardness (kg/mm^2) was as follows: Al_2O_3—2540; MgO—1015; CaO—615; TiO_2—1085; ZrO_2—1230; HfO_2—925; Nb_2O_5—740; Cr_2O_3—2970. It is believed that the hardness of the oxides depends on the probability of metal and oxygen atoms forming stable electron configurations. As the number of stable configurations formed by one or both of the components drops, the number of free electrons increases and the hardness also drops. Orig. art. has: 3 figures and 2 tables.

SUB CODE: 11/ SUBM DATE: 21Jul65/ ORIG REF: 007/ OTH REF: 001/
Card 1/1 UDC: 541.45:539.53

SLYSHEK, Z.O.

Synthetic fiber plant in Cherkassy. Prom. stroi. i inzh. soor. 1 no.1:11-17 O '59. (MIRA 13:12)

1. Glavnyy inzhener tresta No.2, Cherkassy.
(Cherkassy--Textile factories)

PAVLYUCHENKO, M.M.; SLYSHKINA, S.A.; PRODAN, Ye.A.

Thermal stability of natural and synthetic manganese carbonates. Dokl. AN BSSR 9 no.6:379-382 Je '65. (MIRA 18:9)

1. Institut obshchey i neorganicheskoy khimii AN BSSR.

SLYSHKO, V. N.

Slysnko, V. N. "Cases of recognition during the course of an illness by a periatnerite bump," Sbornik naucn. trudov, (Rost. n/D gos. med. in-ta), Vol. VIII, 1948, p/ 169-71

SO: U-2888, Letopis Zhurnal'nykh Statey, No. 1, 1949

SLYSHKO, V. N.

USSR / Human and Animal Physiology (Normal and Pathological). Internal Secretion. Thyroid Gland T

Abs Jour: Ref Zhur-Biologiya, No 21, 1958, 97684

Author : Slyshko, V. N., Dobosh, S. I., Sochka, A. A.

Inst : Uzhgorod University

Title : On Classification of Thyroid Gland Diseases

Orig Pub: Nauchn. zap. Uzhgorodsk. un-t, 1955, 15, 33-38

Abstract: No abstract

Card 1/1

SLYSKO, P.

"Chemical polishing of welded and soldered joints in nonferrous and light metals for metallographic purposes."

p. 270 (Zvaranie) Vol. 6, no 9, Sept. 1957
Prague, Czechoslovakia

SO: Monthly Index of East European Accessions (EEAI) LC. Vol. 7, no. 4, April 1958

The influence of oxygen and hydrogen on copper. Pavel Slyško. *Zvárací sborník* 8, 247–53(1950).—The influence of O and H on melted Cu is correlated with the oxidizing and reducing flame used for welding. Special directions have to be followed when an acetylene flame is used.
Petr Seunelds

SLYSKO, P.

Origin of cracks during brazing; cracking tendency of brazing. p. 500

ZVARACSKY SBORNIK. (Slovenska academie vied) Bratislava, Czechoslovakia
Vol. 8, no. 4, 1959

Monthly list of East European Accessions (EEAI), LC Vol. 9, no. 2, Feb. 1960

Uncl.

"Welding metals; examples of some structures of welded joints." p. 130.

ZVARANIE. (Ministerstvo hutného priemyslu a rudných baní a Ministerstvo strojárenstva). Bratislava, Czechoslovakia, Vol. 8, No. 5, May 1959.

Monthly List of East European Accessions (EEAI), LC, Vol. 8, No. 8, August 1959.
Uncla.

SLYSKO, Pavel, inz.

Structural changes in brass caused by heat. Zvar sbor 9no.3:3[illegible]-324 '60

1. Vyskumny ustav zvaracsky, Bratislava.

SLYSKO, Pavel, inz.

Metalographic investigation of the effect of gases in welding copper alloys. Zvaranie 11 no.1:2-5 Ja '62.

1. Vyskumny ustav zvaracsky, Bratislava.

SLYSKO, Pavel, inz.

Mechanism of hardening and characteristics of welded joints of aluminum and its alloys. Zvar sbor 11 no.3:338-358 '62.

1. Vyskumny ustav zvaracsky, Bratislava.

MINARIK, Roman, inz.; SLYSKO, Pavol, inz.

Resistance welding of aluminum bronzes. Zvaranie 13 no. 7: 193-198 Jl '64.

1. Research Institute of Welding, Bratislava.

L 01112-66 EWT(d)/EPA(s)-2/EWP(w)/EWA(d)/EWP(v)/T/EWP(t)/EWP(k)/EWP(z)/EWP(b)/
ACCESSION NR: AP5016668 EWA(c) MJW/JD/HM/EM CZ/0065/65/000/003/0273/0309

AUTHOR: Slysko, P. (Slyshko, P.) 38 35

TITLE: Precipitation in welded joints of AKN22 (AKNC) material B

SOURCE: Kovove materialy, no. 3, 1965, 273-309

TOPIC TAGS: weld heat treatment, nickel alloy, chromium alloy, heat resistant alloy, annealing, precipitation hardening

ABSTRACT: The object of the present work was the precipitation in welded joints of the Czechoslovak heat-resistant alloy AKN22 (old brand – AKNC), which in its composition resembles the alloy Nimonic 80. It is based on Ni-Cr with the addition of precipitation-hardening elements: Al and Ti. The heat treatment of precipitation-hardenable AKNC alloy consists of solution and precipitation annealing. Due to the thermal impact caused by welding which is performed after solution annealing, the state attained in solution-annealing is disturbed. The author gives a literary survey on heat treatment, especially on precipitation hardening, and he answers questions as to the extent of changes due to welding in the above-mentioned alloy. As the AKN22 alloy is designated for temperatures above 700°C, it must have good

Card 1/3

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structural stability at high temperatures. Therefore, the precipitation in welded joints was followed at temperatures of 700 and 800°C for a time interval of 2, 10, 16, 20, 50, 100, 1000 and 5000 hours. The question arises as to when and where, preferentially, the equilibrium precipitate (η) separates out and whether it causes the increase in hardness. Precipitates in welded joints were observed by means of optical and electron microscopes. The identification of phases was achieved by means of X-ray structural analysis of isolates from welded specimens subjected to precipitation at a given time and temperature. The microanalysis of isolates showed the enrichment or drop in content of respective elements. By examination of macrohardness it was determined whether there was a drop or a rise in hardness due to long-term precipitation annealing. It was found that in short-term precipitation hardening a great volume of the phase γ'-$Ni_3(Ti,Al)$ precipitated in the form of small dispersion globules. Simultaneously, the chromium and titanium carbides $Cr_{23}C$ and TiC also precipitated. Through long-term annealing the γ' particles enlarged and changed their shape as well. In long-term precipitation hardening the γ' precipitates change their globular into angular-to-square forms, and in the following stage they have a cellular form. Through long-term annealing, mainly at 750 and 800°C, the equilibrium precipitate η-Ni_3Ti also precipitates. This results in changed hardness, since after the precipitation of a great volume of η-phase

APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001651420001-1"

L 01112-66
ACCESSION NR: AP5016668

3

(after overaging) there is a big drop in hardness. The transformation into η-phase occurs much more quickly at temperatures of 750 and 800°C than at 700°C. The information obtained confirms that at 700°C AKN22 material is relatively stable. At higher temperatures — 750 and 800°C — the precipitation of η-phase takes place after a short time and it grows in size and volume. This means that there is much quicker overaging at higher temperatures. Because of great inhomogeneity in welds, the equilibrium precipitate +η was found here earlier than in the base metal and the overaging took place much sooner in the welds and heat-affected zone than in the base metal. Orig. art. has: 24 figures and 7 tables.

ASSOCIATION: Vyskumny ustav zvaracsky, Bratislava (Research Institute of Welding)

SUBMITTED: 18Sep64 ENCL: 00 SUB CODE: MM

NO REF SOV: 002 OTHER: 032

Card 3/3

ACC NR: AP7003628 SOURCE CODE: CZ/0065/66/000/006/0463/0477

AUTHOR: Slysko, Pavel

ORG: Welding Research Institut, Bratislavc (Vyzkumny ustav zvaracsky)

TITLE: Does combined heat treatment of Nimonic 80 type alloy lower the tensile strength?

SOURCE: Kovove materialy, no. 6, 1966, 463-477

TOPIC TAGS: heat resistant alloy, nickel alloy, ~~nickel-chromium~~, rupture strength, ~~nickel~~ alloy heat treatment, ARC WELDING, WELD EVALUATION

ABSTRACT: Two series of Nimonic 80-type alloy specimens (0.09% carbon, 73.3% nickel, 20.28% chromium, 1.0% aluminum, 2.0% titanium, 2.85% iron) were welded with an argon-shielded arc and a filler wire of the same composition. Prior to welding, the first series of specimens was annealed at 1080—1100C for 8 hr and air cooled. The specimens of the second series were annealed at 1200C for 4 hr, cooled to 1000C, held for 16 hr, and then air cooled. After welding, all specimens were aged at 700C for 16 hr and air cooled. The specimens of the first series had a rupture life of 600—700 hr at 700C under a stress of 15 kp/mm^2. The fracture always occurred in the weld. The specimens of the second series tested under the same conditions failed in a very short time, not exceeding few hours, and always in the base metal 5—7 mm from the weld. The fracture was intergranular. The experiments repeated with base-metal specimens showed similar results. Specimens aged after

Card 1/2 UDC: none

SLYSZ, Tadeusz, mgr inz.

Laboratory research on thermal oil recovery by combustion under deposit conditions. Nafta Pol 17 no.10:281-284 O '61.

1. Instytut Naftowy, Warszawa.

SLYSZ, Tadeusz

Storing of gas and petroleum products in natural underground containers. Wiad naft 9 no.5:114-116 My '63.

SLYSZ, Tadeusz

Storage of gas and petroleum products in natural underground reservoirs. Wiad naft 11 no.4:85-87 Ap '63.

SLYTSKINA, P. I.

"The Clinical Analysis of Complications During Insulin and Electroshock Therapy of Psychotics." Cand Med Sci, A Joint Council of a Group of Leningrad Institutes, Acad Med Sci USSR, Leningrad, 1954. (RZhBiol, No 2, Jan 55)

Survey of Scientific and Technical Dissertations Defended at USSR Higher Educational Institutions (12)
SO: Sum. No. 556, 24 Jun 55

SLYUDIKOV, L.D.; BIDERMAN, V.L.

New method of mounting tire casings. Kauch.i rez. 19 no.8: 45-46 Ag '60. (MIRA 13:9)

1. Moskovskiy shinnyy zavod i Moskovskoye vysshoye Tekhnicheskoye uchilishche im. Baumana.
(Tires, Rubber)

S/081/63/000/001/060/061
B144/B186

AUTHOR: Slyudikov, L. D.

TITLE: Breaker strip of textile cord in R-type tires

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 1, 1963, 563, abstract 1T273 (Kauchuk i rezina, no. 5, 1962, 47-52)

TEXT: In R-type tires, increase of the internal pressure and action of a radial load cause deformations in the plane of the breaker strip owing to elongation of the cord threads. To obtain greater stiffness of the breaker strip the modulus of the cord must be increased at low loads. [Abstracter's note: Complete translation.]

Card 1/1

SLYUDIKOV, L.D.

Forming of the cord carcass of tire in case of meridional distribution of cord threads. Kauch.i rez. 21 no.3:43-45 Mr '62. (MIRA 15:4)

1. Moskovskiy shinnyy zavod.
(Tires, Rubber)

SLYUDIKOV, L.D.

Profile of the meridional section of the "R" type tire. Kauch.i rez. 21 no.8:27-31 Ag '62. (MIRA 16:5)

1. Moskovskiy shinnyy zavod.

(Tires, Rubber)

SLYUDIKOV, L.D.

"P"-type tires in patent literature. Kauch.i rez. 21 no.9:32-33 S '62. (MIRA 15:11)

1. Moskovskiy shinnyy zavod.
(Tires, Rubber)

KOROLEV, A.I., kand.tekhn.nauk; MIRZOYEV, G.K.; SLYUDIKOV, L.D., kand.tekhn.nauk

Investigating the effect of the front suspension and steering wheel drive on the wear of motor-vehicle tires. Avt.prom. 31 no.5:28-31 My '65. (MIRA 18:5)

1. Moskovskiy avtomekhanicheskiy institut i Moskovskiy shinnyy zavod.

ACCESSION NR: AP4045023 S/0191/64/000/009/0038/0041

AUTHOR: Minenkov, B. V., Slyudikova, N. N.

TITLE: Effect of stabilizing additives on the creep and relaxation of Kapron

SOURCE: Plasticheskiye massy*, no. 9, 1964, 38-41

TOPIC TAGS: friction, abrasion, lubricant, filler, barium sulfate, cadmium iodide, tensile strength, elongation, elastic modulus, creep, thermoplast, relaxation, polycaprolactam, Kapron

ABSTRACT: The effect of different fillers, such as barium sulfate and cadmium iodide, on the physico-mechanical properties of Kapron test samples was investigated at 20 C and 55% relative humidity. The following compositions were used in the experiments: pure Kapron (polycaprolactam); Kapron + 3% CdI_2, Kapron + 20% $BaSO_4$ and Kapron + 20% $BaSO_4$ + 3% CdI_2 molded at 270-280 C and 1000-1200 kgs/cm^2 pressure for 30 sec. The tensile strength and compressibility were measured at a rate of deformation $\xi = 0.1\%$ min. The extension-compression curves show that the addition of CdI_2 decreased the elongation at the break of pure Kapron by almost 60% and increased the strength by 15%; 20% $BaSO_4$ also decreased the elongation at the break and slightly increased the strength. In both cases,

Card 1/3

ACCESSION NR: AP4045023

the modulus of elasticity increased by 23-25%. For all compositions, there was a linear correlation between stress and strain at the given experimental rate, up to 400-500 kgs/cm^2. Under stresses up to 300 kgs/cm^2, relaxation began 40-50 sec. after removal of the load. The compressibility of all the materials was practically the same. The mechanical properties of the test samples under a short-term load are tabulated. Creep curves showed the highest creep for pure Kapron; 3% CdI_2 + 20% $BaSO_4$ decreased the creep of pure Kapron by 50%. When stress relaxation was determined for 500 hours at an initial load of 150 or 100 kgs/cm^2, addition of 20% $BaSO_4$ and 3% CdI_2 decreased the relaxation of pure Kapron by 30%. A comparison showed that the joint effect of these two components decreased not only the relaxation of pure Kapron but also equalized its flow. This is an essential factor in the determination of the serviceability of Kapron products. The permanent characteristics of Kapron are thus improved slightly by additives. The relationship between the stress ratio and the creep rate ratio at 20 C is shown in the Enclosure. Orig. art. has: 5 figures, 1 table and 3 formulas.

ASSOCIATION: None

SUBMITTED: 00 ENCL: 01 SUB CODE: MT

NO REF SOV: 003 OTHER: 000

Card 2/3

ACCESSION NR: AP4045023

ENCLOSURE: 01

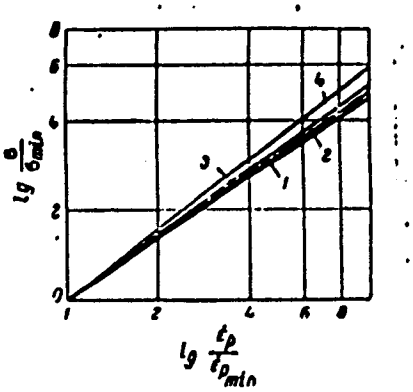

Fig. 1 - Relationship between the stress ratio and the creep rate ratio at 20°C:
1 - pure Kapron, n = 1.5; 2 - Kapron + 3% CdI_2, n = 1.40;
3 - Kapron + 20% $BaSO_4$, n = 1.43;
4 - Kapron + 20% $BaSO_4$ + 3% CdI_2, n = 1.28.

Card 3/3

L 53620-65 EWT(m)/EWP(v)/EPF(c)/EWG(v)/EWA(d)/EPR/EWP(j)/T/EWP(t)/EPA(bb)-2/EWP(b) Pc-4/Pe-5/Pr-4/Ps-4 JD/DJ/RM

ACCESSION NR: AP5016250 UR/0122/64/000/011/0050/0052

AUTHOR: Vorob'yev, Yu. A. (Candidate of technical sciences, Docent); Bezhelukova, Ye. F. (Candidate of technical sciences); Slyudikova, N. N. (Engineer)

TITLE: Effect of operating conditions and clearance on the efficiency of capron slider bearings

SOURCE: Vestnik mashinostroyeniya, no. 11, 1964, 50-52

TOPIC TAGS: antifriction bearing, antiwear additive, ketone, industrial instrument

Abstract: Samples of polycaprolactam + 20% $BaSO_4$ and polycaprolactam + 20% $BaSO_4$ + 3% CdI were tested. The samples were made in the form of sleeves with an inside diameter of d= 40 mm and a wall thickness s= 2, 3, 4 and 5 mm in the Central Laboratory of synthetic materials in the Automatic Factory imeni Likhachev by molding at a pressure of 1000 kg/cm^2 on a "Ziegler" type molding machine. The parts made of capron + 20% $BaSO_4$ were poured at 280° C while those of capron + 20% $BaSO_4$ + 3% CdI were poured at 275° C. The sleeves with wall thickness of 2, 3, 4 and 5 mm were held under pressure for 10, 15, 20 and 25 seconds respectively. The tests were made at the MVTU [Moscow Higher Technical School] on a stand which

Card 1/3

L 53620-65
ACCESSION NR: AP5016250

permitted continuous variation in the speed of rotation of the shaft and in the load. Number 20 industrial oil (number 3 spindle oil) was fed to the bearing by the drop while the tests were being made. The temperature, rate of slide, load and moment of friction in the rotating pair were recorded during the testing. The sleeves were inserted into metal rings and rotated on shafts made of grade 45 steel. For the capron + 20% $BaSO_4$, the coefficient of sliding friction has an average value of 0.009 in the clearance range from 0.15 to 1.2 mm. The shaft starts to stick at a clearance of 0.12 mm and when the clearance is increased past 1.2 mm, the coefficient of friction increases followed by sticking in connection with the reduction in contact area and the consequent increase in unit pressure which causes plastic deformations in the material of the sleeve. The maximum allowable clearance for capron without a filler is much smaller because of the lower module of elasticity in this case. Capron + 20% $BaSO_4$ shows an increase in temperature by 10-15°C when the load is increased from 3 to 10 kg/cm^2. With an increase to 25 kg/cm^2, the temperature increases by 30-35°, this load being the maximum because of the poor thermal conductivity of the plastic when the wall thickness is 4 and 5 mm. The optimum wall thickness for improvement of heat transfer conditions is given by the empirical formula

$$\delta = 1 + (0.04 - 0.05)d \text{ mm.}$$

Card 2/3

L 53620-65

ACCESSION NR: AP5016250

1

The coefficient of friction decreases with an increase in the load on the bearing up to a definite limit and then sharply increases. This is due to the increase in temperature which destroys the plastic bearing. The roughness of the bearing has no appreciable effect on the clearance nor on the coefficient of friction, but the roughness of the metal shaft does have a considerable effect on these quantities, the coefficient of friction becoming stable with a seventh class surface finish. The surface finish of a steel shaft is increased by one class after running for 20 hours. It was also established that the coefficient of friction was reduced and the temperature increased from 30 to 40°C with an increase from 400 to 1000 rpm and a change in the rate of slide from 0.84 to 2.1 m/sec. A further increase in the rate of slide leads to sticking of the shaft and melting of the plastic bearing. Orig. art. has 5 graphs, 1 formula, and 2 figures.

ASSOCIATION: none

SUBMITTED: 00	ENCL: 00	SUB CODE: IE, MT
NO REF SOV: 002	OTHER: 000	JPRS

OR

Card 3/3

L 46648-66 EWT(m)/EWP(j)/T WW/DJ/RM

ACC NR: AR6021270 SOURCE CODE: UR/0081/66/000/004/S087/S087

AUTHOR: Vorob'yev, Yu. A.; Bezhelukova, Ye. F.; Slyudikova, N. N. 61

TITLE: Effect of operating conditions and amount of clearance on efficiency of sliding bearings of polycaprolactam B

SOURCE: Ref zh. Khim, Part II, Abs. 4S564

REF SOURCE: Sb. tr. Mosk. vyssh. tekhn. uch-shcha im N. E. Baumana, v. 4, 1964, 45-54

TOPIC TAGS: organic nitrogen compound, polymer, material deformation, friction, friction coefficient, bushing, bearing material, bearing stability

ABSTRACT: The effect of the amount of clearance, of radial pressure of the slide velocity, of the roughness of the metallic shaft surfaces and of mechanical machining of filled polycaprolactam sliding bearings on their efficiency was studied. It was established that with clearances from 0.15 to 1.2 mm and radial pressures of 10 kg/sq cm the coefficient of friction of the slide is, on the average, 0.009, which assures normal operation of the joint. With clearances up to 0.12 mm and over 1.2 mm the shaft jams due to lack of compensation for thermal deformation in the

Card 1/2

ACC NR: AR6021270

first case, and an increase in specific pressure causing plastic deformation in the second. Changing the radial pressure from 3 to 10 kg/sq cm increases temperature 10 - 15°. At 25 kg/sq cm pressure the temperature increases 30 - 35°, which is the limit for bearings with 4 and 5 mm wall thickness because of poor thermal conductivity of the plastic. On increasing sliding speed from 0.84 to 2.1 m/sec the coefficient of friction decreases and temperature increases from 30 to 40°. Further increase in slide velocity leads to wedging of the shaft and melting of the bearing. The coefficient of friction is stabilized when the shaft surface roughness is within the limits from ▽ 7 class fineness and higher. The coefficient of friction decreases after machining. In testing machined plastic bushings, the coefficient of friction is more stable than for bushings without machining; at the same time machining impairs the wear resistance of the surface of the piece and increases the change in the dimensions of the piece from water absorption. Z. Ivanova. [Translation of abstract].

SUB CODE: 11, 13

Card 2/2

SKORIK, A.D., inzh.-inspektor; KANDAKOV, V.; SLYUNCHENKO, M.D., inzh.; SEDNEV, A.I., inzh. po tekhnike bezopasnosti (Nebit-Dag, Turkmenskaya SSR); SHCHERBAKOV, S., inzh.; RUDAKOV, N.A.

Readers' letters. Bezop. truda v prom. 8 no.11:53-54 N '64. (MIRA 18:2)

1. Upravleniye Sredne-Volzhskogo okruga Gosudarstvennogo komiteta pri Sovete Ministrov RSFSR po nadzoru za bezopasnym vedeniyem rabot v promyshlennosti i gornomu nadzoru (for Skorik). 2. Glavnyy mekhanik zavoda Yacheistykh betonov, Tatarskaya ASSR (for Kandakov). 3. Nachal'nik proyektno-konstruktorskogo byuro tresta Novovolynskugol' (for Slyunchenko). 4. Upravleniye l'vovskogo okruga Gosudarstvennogo komiteta pri Sovete Ministrov UkrSSR po nadzoru za bezopasnym vedeniyem rabot v promyshlennosti i gornomu nadzoru (for Shcherbakov). 5. Amakinskaya ekspeditsiya Yakutskogo geologicheskogo upravleniya (for Rudakov).

LIVYY, G.V.; KAZARINA, N.N.; GIL'MAN, B.A.; RUDENKO, S.D.; DREVINA, N.G.; [redacted]RTNAYA, N.S.; ALPATSKAYA, V.P.; KOZLOVSKIY, S.I.; SLYUNIN, B.S.

Development and application of reinforced film coating of sheepskins for coats. Kozh.-obuv.prom. 4 no.3:25-28 Mr '62. (MIRA 15:5)
(Fur--Dressing and dyeing)

SLYUNIN, V.

Improving management of apartment houses in the city of Orel. Zhil.-kom.khoz. 10 no.3:4-6 '60. (MIRA 13:7)

1. Sekretar' Orlovskogo gorodskogo komiteta Kommunisticheskoy partii Sovetskogo Soyuza.
(Orel--Apartment houses--Management)

SLYUNIN, V.

Party organization and municipal economy. Zhil.-kom. khoz. 12 no.4:8-10 Ap '62. (MIRA 15:7)

1. Pervyy sekretar' Orlovskogo gorodskogo komiteta Kommunisticheskoy partii Sovetskogo Soyuza.
(Orel--Communist Party of the Soviet Union--Party work)
(Orel--Municipal services)

KAZARINA, N.N., inzh.; GIL'MAN, B.A., inzh.; SLYUNIN, V.S., inzh.

New method of degreasing greasy sheep pelts. Izv.vys.ucheb.zav.; tekh. leg.prom. no.2:29-32 '61. (MIRA 14:5)

1. Rekomendovana kafedroy tekhnologii kozhi Kiyevskogo tekhnologicheskogo instituta legkoy promyshlennosti.
(Hides and skins)

L 17550-65 EWT(1)/EEC(m)/EWA(h) Peb AFMD(p)/ASD(a)-5/AFETR/AFTC(b)/ESD(dp)/SSD

ACCESSION NR: AR4049284 S/0272/64/000/008/0139/0139

SOURCE: Ref. zh. Metrologiya i izmeritel'naya tekhnika. Otd. vy*p., Abs. 8.32.935

AUTHOR: Belousov, V.M., Slyunyayev, A.P., Kulikovskiy, K.L. 8

TITLE: A two-phase vector meter

CITED SOURCE: Nauchn. tr. vuzov Povolzh'ya, vy*p. 1, 1963. 234-238

TOPIC TAGS: vector meter, ferrodynamic meter, computer technology, induction meter

TRANSLATION: The two-phase ferrodynamic vector gauge is mounted in the housing of a portable M 91/A galvanometer. The measuring mechanism of the vector gauge consists of a magnetic circuit, two excitation coils and a movable, mirror-equipped frame mounted on braces. The instrument uses an optical system and a galvanometer dial. Line voltage is 220/127 volts, frequency is 50 cycles/second. Measurement range of the instrument is up to 250 mv in terms of voltage and up to 1 ma in terms of current. It can be widened by incorporating the appropriate additional resistances and shunts. The unit weight is about 4 kg. Maximum reduced error does not exceed 2.5% or 30' in terms of phase error. The developed instrument can be used as a receiver for induction sensors in which the phase of the

Card 1/2

L 17550-65

ACCESSION NR: AR4049284

output electromotive force changes when the core is moved. Since sin φ and cos φ can be accepted as constant magnitudes for small values of φ, the characteristics of the system will not depend on φ. The unit can also be used as an element in computer technology, where requirements exist for determining sin φ + cos φ. Four illustrations.

ENCL: 00 SUB CODE: EE, DP

Card 2/2

33483
S/195/61/002/005/008/027
E040/E485

5 1190
11.0132

AUTHORS: Minachev, Kh.M., Kondrat'yev, D.A., Slyunyayev, P.I.

TITLE: Investigation by means of thiophene-S^{35} of the poisoning of platinum-alumina catalysts containing various proportions of the metal

PERIODICAL: Kinetika i kataliz, v.2, no.5, 1961, 690-693

TEXT: Platinum-alumina catalysts are of a considerable practical importance in the petroleum industry and for this reason the authors carried out previously a series of systematic studies of the poisoning of these catalysts by sulphur during the dehydrogenation of cyclohexane at elevated temperatures (Ref.1, 2 and 3: Izv. AN SSSR, Otd. khim. n., 1960, 300; 1960, 902; 1960, 877). In the present article the results are given of further studies in the above series, the specific purpose of the work being to: 1. derive the relationship existing between Pt concentration in the catalyst mixture and the quantity of sulphur that must be deposited on the catalyst in order to inhibit its catalytic activity; 2. elucidate the distribution of sulphur in the catalyst layer and 3. correlate the degree of catalyst

Card 1/ 3

33483
S/195/61/002/005/008/027
E040/E485

Investigation by means of ...

poisoning with the concentration of sulphur deposited on it. The catalysts used in the investigations contained 0.05, 0.3, 0.7, 1.0, 3.0, 6.0 and 10% platinum, the rest being alumina. The mixed catalysts were prepared by saturating powdered alumina with the required quantity of chloroplatinic acid. All the catalysts were poisoned during dehydrogenation of cyclohexane by adding to it 2% thiophene labelled with S^{35} radioisotope. The test temperature was 450°C and the pressure in the reaction vessel was maintained at 20 atm H_2. The reaction time was varied up to 10 hours. It was found that up to 90% of all the sulphur deposited on the catalyst during the reaction period of 10 hours is deposited during the first 2 to 3 hours of the test time. The quantity of the sulphur deposited increases also with the increasing concentration of Pt in the mixed catalyst, but this increase is not a linear function of the Pt content in the catalyst. Tests carried out on catalyst regeneration by passing over it pure cyclohexane showed that, after a reaction time of about 5 hours, the quantity of sulphur deposit on the catalyst amounts to about 30% of the initial concentration. No further significant reduction in the sulphur concentration on the catalyst was

Card 2/3

MINACHEV, Kh.M.; KONDRAT'YEV, D.A.; SLYUNYAYEV, P.I.

Effect of thiophene on the properties of alumina-platinum catalysts under conditions of dehydroisomerization of methylcyclopentane. Izv. AN SSSR. Ser. khim. no.7:1169-1174 '65. (MIRA 18:7)

1. Institut organicheskoy khimii im. N.D.Zelinskogo AN SSSR.

MIRACHEV, Kh.M.; KONDRAT'YEV, D.A.; SLYUNYAYEV, P.I.

Effect of thiophene on an aluminum-molybdenum catalyst under conditions of cyclohexane dehydrogenation under hydrogen pressure. Izv. AN SSSR. Otd.khim.nauk no.5:806-809 My '62. (MIRA 15:6)

1. Institut organicheskoy khimii im. N.D.Zelinskogo AN SSSR.
(Catalysts) (Dehydrogenation) (Cyclohexane) (Thiophene)

MINACHEV, Kh.M.; KONDRAT'YEV, D.A.; SLYUNYAYEV, P.I.

Effect of thiophene on the properties of Pd-, Rh-, Ru-, and Pt-Al_2O_3 catalysts under conditions of cyclohexane dehydrogenation. Izv. AN SSSR. Ser. khim. no.6:999-1003 '65. (MIRA 18:6)

1. Institut organicheskoy khimii imeni Zelinskogo AN SSSR.

ATLAS, M.,prof.; ZLOBIN, I.,prof.; SLYUS,G.,dots.

Valuable work ("Financial capital and its forms of organization" by V.E.Motylev. Reviewed by M.Atlas, I.Zlobin, G. Solius). (MIRA 13:11)
Den. i kred. 18 no.11:87-92 N'60.
(Finance) (Capital) (Motylev, V.E.)

SLYUSAR', B. F., Cand Phys-Math Sci -- (diss) "A Study of the For ation of Thermal Vacancies in the Crystalline Grid of Metals and Alloys." Kiev, 1958. 13 pp, (Min~~istery~~ of Higher Education UkSSR. Kiev State Univ~~ersity~~ imeni T. G. Shevchenko), 150 copies. Bibliography at end of text. (KL, 34-58, 99)

4

SOV/126-6-6-14/25

AUTHORS: Gertsriken, S. D., Slyusar, B. F.

TITLE: On Determination of the Energy of Formation and of the Number of Vacancies in Pure Metals (Ob opredelenii energii obrazovaniya vakansiy i ikh chisla v chistykh metallakh)

PERIODICAL: Fizika metallov i metallovedeniye, 1958, Vol 6, Nr 6, pp 1061-1069 (USSR)

ABSTRACT: The energy of formation of vacancies, E_ϑ, in several pure metals was determined by measuring their electrical resistance and thermal expansion in a wide range of temperatures. The electrical resistance ρ is given by:

$$\rho = A + BT + CT^2 + D \exp\left(-\frac{E_\vartheta}{RT}\right) \qquad (3)$$

where A, B, C and D are constants, R is the gas constant and T is temperature. At relatively low temperatures the last term of Eq.(3) can be neglected. Therefore, using the data obtained at low temperatures, the constants A, B and C can be found. The authors then calculated:

$$\rho_{calc} = A + BT + CT^2 \qquad (4)$$

Card 1/7

On Determination of the Energy of Formation and of the Number of Vacancies in Pure Metals

for high temperatures and subtract it from the experimental value of the electrical resistance at high temperatures,

ρ_{exp} :

$$\Delta\rho = \rho_{exp} - \rho_{calc} = D \exp\left(-\frac{E_\partial}{RT}\right) \text{ or } \ln \Delta\rho = \text{const} - \frac{E_\partial}{RT}. \quad (5)$$

The value of E_∂ is then found from the slopes of the straight lines $\log \Delta\rho = f(1/T)$ (Fig.1, 2). This method was first described by Meechan and Eggleston (Ref.6). The authors used this method to find E_∂ for gold (99.99% purity), copper (99.99%), silver (99.99%), aluminium (99.995%), lead (99.995%), zinc (99.98%), cadmium (99.99%) and tin (from the Kal'baum Co.). The samples were in the form of wire 0.1-1 mm in diameter and 25-150 cm in length. The samples were annealed for 2 to 3 hours at a high temperature and were then cooled slowly to room temperature. The

On Determination of the Energy of Formation and of the Number of Vacancies in Pure Metals

electrical resistance was measured by means of an apparatus described by Trogrushchenko (Ref.8). Table 1 gives, by way of example, ρ_{exp}, ρ_{calc} and $\Delta\rho$ for cadmium. The values of E_∂, obtained for the 8 metals using the Meechan and Eggleston method, are given in column 2 of Table 2. The energy of formation of vacancies and their number can be determined also from the thermal expansion (dilatometric method). This method is based on the following reasoning. If, due to thermal motion, atoms are ejected from certain sites in the crystal lattice (vacancy formation) and these atoms form new cells, then the volume of the crystal increases, not only due to thermal vibrations of the atoms but also because of formation of these new cells. It is assumed that the increase of the length of a sample due to these two causes is given by:

$$\frac{l_t}{l_0} = A + BT + CT^2 + \frac{1}{3}\kappa \exp\left(-\frac{E_\partial}{RT}\right) , \qquad (6)$$

Card 3/7 where l_0 is the original length of the sample, l_t is

On Determination of the Energy of Formation and of the Number of Vacancies in Pure Metals

the length at temperature $t^{o}C$, T is the absolute temperature and A, B, C and μ are constants. (Note: A, B and C are not the same constants as in Eq.(3)). As before, the last term of Eq.(6) is important only at comparatively high temperatures when a large number of vacancies is formed. The constants A, B and C in Eq.(6) were determined by measurements of thermal expansion at comparatively low temperatures, and then:

$$\left(\frac{l_t}{l_o}\right)_{calc} = A + BT + CT^2 \qquad (7)$$

was calculated and subtracted from the experimental value, $(l_t/l_o)_{exp}$, obtained at high temperatures. Then:

$$\Delta = \left(\frac{l_t}{l_o}\right)_{exp} - \left(\frac{l_t}{l_o}\right)_{calc} = \frac{1}{3}\mu \exp\left(-\frac{E_\partial}{RT}\right), \qquad (8)$$

Card 4/7

On Determination of the Energy of Formation and of the Number of Vacancies in Pure Metals

$$\left(\frac{l_t}{l_0}\right)^3_{exp} - \left(\frac{l_t}{l_0}\right)^3_{calc} = 3\Delta \quad , \qquad \text{and} \qquad (9)$$

$$3\Delta = \frac{v}{V} = -\frac{n}{N} = \kappa \exp\left(-\frac{E_\partial}{RT}\right) \quad ,$$

where v is the volume occupied by all vacancies, V is the volume occupied occupied by atoms, n is the number of vacancies at temperature T and N is the number of atoms in a crystal. It is assumed that the volume of one vacancy is equal to the volume of one atom. By constructing straight lines $\log 3\Delta = f(1/T)$, the energy of formation of vacancies can be obtained from the slopes of these lines (Figs.3, 4). The samples used in thermal expansion experiments were in the form of cylinders, 20-25 mm in length and $\sim$3.6 mm in diameter. After preparation the samples were annealed for 2 to 3 hours at a high temperature and were then cooled slowly to room temperature. Table 3 gives, by way of example, values of $(l_t/l_0)_{exp}$, $(l_t/l_0)_{calc}$ and Δ for cadmium. The

On Determination of the Energy of Formation and of the Number of Vacancies in Pure Metals

values of the energy of formation of vacancies found, using the dilatometric method, are given in column 3 of Table 2. The values for gold, copper and silver are marked with stars because they were obtained using the data of Gertsriken (Ref. 2). Column 4 of Table 2 gives values of $E_д$ which are averages of the electrical resistance and dilatometric values. These values were of the order of 10 kcal/g-atom (8.7 for zinc, to 15.95 for gold and copper). Table 2, column 6 shows that the relationship $E_д \sim E_{cд}/3$, where $E_{cд}$ is the energy of activation of self-diffusion, is obeyed by all the metals studied with the exception of cadmium. Column 8 of Table 2 shows that $E_д \sim 2E_{cубл}/3$ is roughly obeyed by all the metals studied with the exception of zinc and cadmium. The authors calculated also the pre-exponential multiplier κ in Frankel's equation:

$$n/N = \kappa \exp(-E_д/RT)$$

On Determination of the Energy of Formation and of the Number of Vacancies in Pure Metals

where n is the number of vacancies at temperature T and N is the number of atoms in a crystal. These values of κ are given in Table 6, column 2. The same table gives also the calculated value of the relative number of vacancies near the melting-point (column3) and the rise in electrical resistance due to 1% of the total number of vacancies (column 4). Acknowledgments are made to students N. Novikov and V. Shiyanovskiy for their help in experiments. There are 4 figures, 7 tables and 28 references of which 9 are Soviet, 14 English, 4 German and 1 French.

ASSOCIATION; Kiyevskiy gosuniversitet (Kiyev State University)

SUBMITTED: July 2, 1957.

Card 7/7

GERTSRIKEN, S.D. [Hertsriken, S.D.]; SLYUSAR, B.F.

Thermal vacancies in metals and alloys review. Ukr. fiz. zhur. 4 no.2:137-151 Mr-Ap '59. (MIRA 13:1)

1. Kiyevskiy gosuniversitet im. T.G. Shevchenko.
(Metal crystals) (Alloys)

GERTSRIKEN, S.D. [Hertsriken, S.D.]; LARIKOV, L.N.; SLYUSAR, B.F. [Sliusar, B.P.]

Determining the latent energy of deformation in copper, copper-zinc alloys and in Armco iron by the calorimetric method. Ukr. fiz. zhur. 5 no. 5:672-676 S-O '60. (MIRA 14:4)

1. Institut fiziki metallov AN USSR.
(Deformation (Mechanics)) (Copper)
(Copper-zinc alloys) (Iron)

69701
S/126/60/009/03/027/033
E193/E483

On the Problem of Using Dilatometric Measurements for Determining the Density of Thermally Induced Vacancies, the Energy of their Formation and the Activation Energy of their Annihilation

assumption that, in the course of the formation of vacancies during heating, migration of atoms to the surface of the specimens takes place (in which case, annealing of quenched specimens should result in migration of the vacancies to the surface of the specimen), Lazarev et al give a formula

$$\frac{\Delta V}{V} = \frac{\Delta l}{l_1} \quad \frac{\Delta l}{l_2} \quad \frac{\Delta l}{l_3} \qquad (2)$$

(where l_1, l_2, and l_3 are the length, width and thickness of the specimen) which takes the form of Eq (1) only for a cube specimen; in the case, for instance, of a wire specimen of a length l_1, $\Delta l/l_1$ will be very small and incorrect values of $\Delta V/V$ will be obtained if they are determined from data on $\Delta l/l_1$. To prove this contention, Lazarev et al quenched from a high temperature, a gold specimen in the form of a foil

Card 2/6

S/126/60/009/03/027/033
E193/E483

On the Problem of Using Dilatometric Measurements for Determining the Density of Thermally Induced Vacancies, the Energy of their Formation and the Activation Energy of their Annihilation

(100 mm long, 0.1 mm thick) bent to form a cylinder 3 mm diameter and subjected it to an isothermal annealing treatment during which no change in the length of the specimen was observed. According to the present authors, however, there is evidence that thermally induced vacancies do not migrate to the surface of specimens when they are annealed after having been quenched from a high temperature. Thus for instance, in the course of an investigation carried out by the present authors (Ref 4), silver foil (130 x 3 x 0.03 mm) was quenched from approximately 650°C and it was found that a thermo-electromotive force E_o was generated in the couple formed by the quenched and annealed specimens and that E_o diminished during the annealing process. If the lower value of the thermo-electromotive force is denoted by E, it is easy to show that for a short-time interval t

Card 3/6

69701

S/126/60/009/03/027/033
E193/E483

On the Problem of Using Dilatometric Measurements for Determining the Density of Thermally Induced Vacancies, the Energy of their Formation and the Activation Energy of their Annihilation

$$D = \left(\frac{E_o - E}{E_o}\right)^2 \frac{h^2}{t} \cdot \frac{\pi}{64}$$

where D is the coefficient of diffusion for vacancies and h is the thickness of the foil. However, when these experiments were repeated with foil three times thicker ($h \simeq 0.1$ mm), all other conditions remaining the same, the magnitude of

$$\left(\frac{E_o - E}{E}\right)^2 \cdot \frac{1}{t}$$

remained practically constant, although on the basis of the previous experiments a change by a factor of 10 could be expected. It was inferred from these results that dislocations act as sinks for vacancies. If the vacancies do not migrate to the surface of the annealed

Card 4/6

69701
S/126/60/009/03/027/033
E193/E483

On the Problem of Using Dilatometric Measurements for Determining the Density of Thermally Induced Vacancies, the Energy of their Formation and the Activation Energy of their Annihilation

specimen, then in analogy to the volumetric changes occurring during heating or cooling, it could be stated that

$$\frac{\Delta V}{V} = \frac{\Delta l_1}{l_1} + \frac{\Delta l_2}{l_2} + \frac{\Delta l_3}{l_3} \quad \text{or} \quad \frac{\Delta V}{V} = 3\frac{\Delta l}{l}$$

since

$$\frac{\Delta l_1}{l_1} = \frac{\Delta l_2}{l_2} = \frac{\Delta l_3}{l_3} = \frac{\Delta l}{l}$$

Bauerle and Rochler, who conducted experiments on quenched gold wires 100 mm long, 0.4 to 0.8 mm diameter observed that the length of these specimens decreased during isothermal annealing and found that

$$\frac{\Delta l}{l} = K \frac{\Delta \rho}{\Delta \rho_0}$$

Card 5/6

69701
S/126/60/009/03/027/033
E193/E483

On the Problem of Using Dilatometric Measurements for Determining the Density of Thermally Induced Vacancies, the Energy of their Formation and the Activation Energy of their Annihilation

where K is a constant, $\Delta\rho_o$ electrical conductivity and $\Delta\rho$ the variation of electrical conductivity. Based on these results, a formula was postulated (Ref 8) in the form

$$\frac{\Delta V}{V} = 1.53 \exp\left(-\frac{0.98}{kT}\right)$$

where 0.98 eV is the energy of formation of vacancies. On the basis of the above considerations, the present authors concluded that dilatometric method can be used for determination of the concentration, energy of formation and activation energy of annihilation of thermally induced vacancies. There are 9 references, 4 of which are Soviet and 5 English.

ASSOCIATION: Kiyevskiy gosudarstvennyy universitet imeni T.G.Shevchenko (Kiyev State University imeni T.G.Shevchenko)

SUBMITTED: June 2, 1959

Card 6/6

39651
S/137/62/000/007/034/072
A057/A101

17200

AUTHORS: Gertsriken, S. D., Slyusar, B. F.

TITLE: Investigations of defects of the crystalline structure arising during deformation in titanium and other metals

PERIODICAL: Referativnyy zhurnal, no. 7, 1962, 4, abstract 7I20 ("Sb. nauchn. rabot In-ta metallofiz. AN USSR", 1961, no. 12, 93 - 97)

TEXT: The latent energy W of plastic deformation of Ti was determined by the differential calorimeter method. Ti iodide (99.98%) samples in form of wires with 1.6 mm diameter were deformed by torsion to a 0.23 degree. A mean value for the energy $W = (1.6 \pm 0.2)$ cal/g was obtained. The high value of W for the relatively small deformation degree is explained by the hexagonal structure of Ti up to 880°C. The density of defects formed during deformation in Ti was determined by the dilatometric method. The density of dislocations was found to be $6.3 \cdot 10^{11}$ cm^{-2}. The microhardness was measured along the diameter of the samples after torsion. The microhardness decreased towards the center of the sample. The values of energy for the unit of the length of dislocation were also deter-

Card 1/2

Investigations of defects of...

mined, and are in good agreement with the theoretically determined values by Cotrell.

N. Sokolov

[Abstracter's note: Complete translation]

Card 2/2

35172
S/601/61/000/013/004/017
D207/D302

18.1795

AUTHORS: Gertsriken, S. D. (deceased) and Slyusar, B. F.

TITLE: Determining the mean dislocation density in deformed molybdenum and yttrium, using the microhardness method

SOURCE: Akademiya nauk Ukrayins'koyi RSR. Instytut metalofyzyky. Zbornik nauchnykh rabot, no. 13, 1961. Voprosy fiziki metallov i metallovedeniya, 74-79

TEXT: The authors report on determination of the dislocation density in molybdenum, yttrium and yttrium alloys, using values of the Brinell microhardness and the ultimate tensile strength. Molybdenum sheet was annealed for 3 hours at 1000°C and plastically deformed by cold-rolling. A series of Mo samples was used: Their plastic deformation (ε) ranging from 0 to 67% and their microhardness (H_B) ranging from 242 to 297 kg/mm^2. Using a relationship derived by S. D. Gertsriken and N. N. Novikov, the dislocation density N_d was found from H_B. The value of N_d in Mo rose from 0 at ε = 0% to 5 x

Card 1/2

S/601/62/000/016/010/029
E111/E451

AUTHOR: Slyusar, B.F.

TITLE: Latent energy of deformation in copper and aluminium

SOURCE: Akademiya nauk Ukrayins'koyi RSR. Instytut metalfyzyky. Sbornik nauchnykh rabot. no.16. Kiev, 1962. Voprosy fiziki metallov i metallovedeniya. 71-76

TEXT: In the plastic deformation of a metal, part of the energy is stored in the form of disturbances of the crystal structure. This latent energy is evolved when the metal is annealed. As the published data are very discordant, partly because different methods of deformation were used, the latent energy of metals deformed in different ways was determined either by torsion of specimens 18 to 21 mm in diameter with a working length of 170 to 240 mm or by filing into particles 300 to 400 μ in size. The latent energy was measured by a differential calorimeter and the dislocation density in both the torsion-deformed and the filed materials was determined by microhardness with suitable averaging procedures. With БК (BK)-grade copper the latent energy of specimens deformed to fracture by torsion is less than that for

Card 1/2

Latent energy ...

filings, indicating a higher degree of deformation for the filings. With 99.995% pure aluminium in torsion it was found that both the latent energy of deformation and the dislocation density change comparatively little over the range of deformation D = 0.8 to 2.2 (where D is the product of the number of revolutions during torsion and the specimen diameter divided by the specimen length). With an increasing degree of deformation the amount of energy absorbed rises but its ratio to the energy expended on deformation falls. The energy per unit length of dislocation for copper deformed by torsion was found to be 2.4×10^{-4} erg/cm, for copper filings 2.9×10^{-4}, while for aluminium at D = 2.2, 1.5, 0.8 and 0.4 it was 3.6×10^{-4}, 4.0×10^{-4}, 3.0×10^{-4} and 3.8×10^{-4} respectively. The coefficients of rigidity of copper and aluminium atoms were calculated using the values found for the latent energy of deformation and the published values for the relative volume changes due to the disappearance of the dislocations; they agreed well with the theoretical values. There are 2 figures and 1 table.

SUBMITTED: November 27, 1961

Card 2/2

GERTSRIKEN, S.D. [Hertsriken, S.D.] (deceased); SLYUSAR, B.F. [Sliusar, B.P.]

Determination of the heat of allotropic transformation in titanium, zirconium and the alloy Ti - 6.5 per cent Cr. Ukr.fiz. zhur. 7 no.4:439-442 Ap '62. (MIRA 15:8)

1. Institut metallofiziki AN UkrSSR, g. Kiyev.
(Titanium) (Zirconium) (Titanium-chromium alloys)

AM4017086 BOOK EXPLOITATION S/

Gertsriken, S. D.; Dekhtyar, I. Ya.; Krivoglaz, M. A.; Larikov, L. N.; Lyasak, L. I.; Nesterenko, Ye. G.; Novikov, N. N.; Sosnina, Ye. I.; Slyusar, N. F.; Tikhonov, L. V.; Trofilov, V. I.; Chuistov, K. V.

Physical bases of the strength and ductility of metals (Fizicheskiye osnovy prochnosti i plastichnosti metallov) Moscow, Metallurgizdat, 1963. 321 p. illus., biblio. Errata slip inserted. 4250 copies printed. Editor of the publishing house: Ye. N. Berlin; Technical editor: L. V. Dobuzhinskaya; Bindery artist: Yu. M. Vashchenko

TOPIC TAGS: strength of metals, ductility, crystal lattice, dislocations, metal failure, strain hardening, solid solution, microstress, lattice defect, plastic strain, relaxation, polygonization, recrystallization, grain growth

PURPOSE AND COVERAGE: This collection of articles is intended for scientific personnel and for engineers and metals physicists; it also may be useful to students at metallurgical and machine-building vuzes. The results of study of crystal-lattice imperfections and the dislocation theory of metal failure are

Card 1/3

AM4017086

presented. Contemporary concepts of the nature and mechanism of different weakening processes in metals are expounded, as well as present-day thinking concerning the effect of impurities on the kinetics of the weakening processes. The articles in this collection are principally the original results of research performed in recent years at the Institut Metallofiziki AN USSR.

TABLE OF CONTENTS:

Card 2/3

AM4017086

SUB CODE: ML, AP SUBMITTED: 23Aug63 NR REF SOV: 253

OTHER: 463 DATE ACQ: 17Jan64

Card 3/3

ACCESSION NR: AT4010690 S/2601/63/000/017/0068/0071

AUTHOR: Slyusar, B. F.

TITLE: Thermal and dilatometric effects during annealing of deformed zirconium

SOURCE: AN UkrRSR. Insty*tut metalofizy*ky*. Sbornik nauchny*kh trudov, no. 17, 1963. Voprosy* fiziki metallov i metallovedeniya, 68-71

TOPIC TAGS: metal hardening, hardness, energy absorption, thermal stability, annealing, zirconium, deformation, crystallization deformed zirconium, zirconium annealing, cold plastic deformation

ABSTRACT: During the cold plastic deformation of metals, most of the mechanical energy used during the process of deformation is converted into heat. However, part of the energy used accumulates in the metal as absorbed (latent) energy of deformation, which creates defects in the crystalline structure of metals. During the process of annealing the absorbed energy that occurs during recovery and recrystallization is liberated. The study of the liberation of absorbed energy of deformation which occurs during the process of annealing deformed metals, gives valuable information about the thermal stability of

Card 1/3

ACCESSION NR: AT4010690

defects (flaws) and indicates which of them are responsible for changes in various properties of metals. The present article deals with the processes which occur during the annealing of deformed iodized Zr. To determine the absorbed energy of deformation a differential calorimeter, previously described by S. D. Gertsriken, L. H. Larikov and B. P. Slyusar, was used. To evaluate the defects formed in zirconium during deformation, the dilatometric method was used as described by S. D. Gertsriken and M. M. Novikov. An analysis of the data showed that the total absorbed energy of Zr is fairly high for comparatively low levels of deformation. This phenomenon could be explained by the fact that at temperatures below 865C, Zr has an hexagonal structure and, because of this, has only one sliding surface, the base plane. As a result, Zr is deformed less readily than metals with a cubic structure. The levels of deformation of Zr achieved during this study were high and the accumulation of energy was considerable. The liberation of absorbed energy during tempering of the sample deformed to 15% showed a relative maximum at 350C and an absolute maximum at approximately 620C. The first maximum is probably connected with liberation during recovery; the second, with the process of recrystallization. Increasing the degree of deformation to 30%, the second maximum occurs at 550C. The curves were in accordance with the data given by Sato. The examination of Mg and Ti

Card 2/3

ACCESSION NR: AT4010690

showed approximately the same effects. The absorbed energy of deformation of Ti was also found to be high. It would be of interest to study in greater detail the absorption of energy during the plastic deformation of other metals with hexagonal lattices and to try various forms of deformation such as twisting, compressing, drawing out, and rolling. Orig. art. has: 2 formulas, 2 figures, and 2 tables.

ASSOCIATION: Insty*tut metalofizy*ky* AN Ukr RSR (Institute of Metallurgical Physics AN Ukr RSR)

SUBMITTED: 00	DATE ACQ: 31 Jan64	ENCL: 00
SUB CODE: MM	NO REF SOV: 007	OTHER: 002

Card 3/3

SLYUSAR, B.F.; SHALAYEV, A.M.

Heat effect in gray cast iron during annealing following irradiation by gamma rays. Fiz. met. i metalloved. 19 no.4:636-637 Ap '65. (MIRA 18:5)

1. Institut metallofiziki AN UkrSSR.